

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (currently amended) A game apparatus for moving a moving object on a road in a virtual world, wherein line segments extend between the edges of the road and each of the line segments is divided into line segment regions, and for each neighboring pair of the line segments, the end points of the regions of the first line segment of the pair and the end points of the regions of the second line segment of the pair are connected sequentially from both the edges of the pair and the quadrilateral areas or triangular areas are formed, said game apparatus comprising:

an input reception unit which receives an operational input from a player;

a storage unit which stores a position and a velocity of the moving object and passage numbers, each of which represents a number of times the moving object passed through each of the regions;

a calculation unit which checks in which quadrilateral area or triangular area the moving object is included, estimates a passage number representing a number of times the moving object passed at the stored position of the moving object from the stored passage numbers of the one or two regions of the area including the moving object, and calculates an influence on the moving object based on the received operational input from the player, the stored position of the moving object, and the estimated passage number; and

an update unit which updates the stored position and the stored velocity of the moving object in accordance with the calculated influence, and increments the passage number that was stored of the region which is intersected by a line connecting the previous position and the updated position of the moving object[.], and

wherein, said calculation unit

(a) estimates the passage number for each triangular area having one line segment region for which passage number L has been stored, as L; and

(b) divides each quadrilateral area bounded by two line segment regions for one of which passage number M has been stored and for the other of which passage number N ($M < N$) has been stored so that $N - M + 1$ number of small quadrilateral areas are arrayed in a row and so that one end of the row is defined by the line segment region with the stored passage number M and other end of the row is defined by the line segment region with the stored passage number N, and estimates respective passage numbers of the arrayed small quadrilateral areas, as M, M+1, M+2..., N-2, N-1, N, respectively in order from one small quadrilateral area at said one end of the row to another small quadrilateral area at the other end of the row.

2. (previously presented) The game apparatus according to claim 1, wherein:
said calculation unit calculates an acceleration of the moving object as the influence on the moving object; and

said update unit updates the stored position and velocity of the moving object in accordance with the calculated acceleration.

3. (previously presented) The game apparatus according to claim 2, wherein:
said storage unit stores a reference frictional force at each position on the road and
said calculation unit calculates the acceleration of the moving object by obtaining a frictional force given on the moving object utilizing the stored reference frictional force at the stored position of the moving object.

4. (original) The game apparatus according to claim 2, further comprising a display unit, wherein
said display unit displays at least one of the stored position and velocity of the moving object.

5. (canceled)

6. (previously presented) The game apparatus according to claim 2, wherein
said calculation unit calculates the acceleration of the moving object by obtaining a frictional force given on the moving object in accordance with the estimated passage number.

7. (previously presented) The game apparatus according to claim 6, wherein said calculation unit calculates the acceleration of the moving object in a manner that the acceleration increases as the estimated passage number increases.

8. (previously presented) The game apparatus according to claim 7, wherein:
said storage unit further stores an objective route within the road;
said update unit updates the objective route that was stored in accordance with the passage number that was stored of the moving object; and
a display unit displays objective route that was stored.

9. (currently amended) A game method for moving a moving object on a road in a virtual world, wherein line segments extend between the edges of the road and each of the line segments is divided into line segment regions, and for each neighboring pair of the line segments, the end points of the regions of the first line segment of the pair and the end points of the regions of the second line segment of the pair are connected sequentially from both the edges of the pair and quadrilateral areas or triangular areas are formed, by using a storage unit for storing a position and a velocity of the moving object passage numbers, each of which represents a number of times the moving object passed through each of the regions, said method comprising:

an input receiving step of receiving an operational input from a player;
a calculating step of checking in which quadrilateral area or triangular area the moving object is included, estimating a passage number representing a number of times the moving object passed at the stored position of the moving object from the stored passage numbers of the one or two regions of the area including the moving object, and calculating an influence on the moving object, based on the received operational input from the player, the stored position of the moving object, and the estimated passage number; and

an updating step of updating the stored position and the stored velocity of the moving object in accordance with the calculated influence and incrementing the stored passage number of the region which is intersected by a line connecting the previous position and the updated position of the moving object[[]], and

wherein, said calculation unit

(a) the passage number for each triangular area having one line segment region for which passage number L has been stored is estimated as L; and

(b) each quadrilateral area bounded by two line segment regions for one of which passage number M has been stored and for the other of which passage number N ($M < N$) has been stored is divided so that $N - M + 1$ number of small quadrilateral areas are arrayed in a row and so that one end of the row is defined by the line segment region with the stored passage number M and other end of the row is defined by the line segment region with the stored passage number N, and estimates respective passage numbers of the arrayed small quadrilateral areas, as M, M+1, M+2..., N-2, N-1, N, respectively in order from one small quadrilateral area at said one end of the row to another small quadrilateral area at the other end of the row.

10. (canceled)

11. (previously presented) A computer-readable information recording medium storing a program, in order to move a moving object on a road in a virtual world, wherein line segments extend between the edges of the road and each of the line segments is divided into line segment regions for each neighboring pair of the line segments, the end points of the regions of the first line segment of the pair and the end points of the regions of the second line segment of the pair are connected sequentially from both the edges of the pair and quadrilateral areas or triangular areas are formed, said program controlling a computer to function as:

an input reception unit which receives an operational input from a player;

a storage unit which stores a position and a velocity of a moving object and passage numbers, each of which represents a number of times the moving object passed through each of the regions;

a calculation unit which checks in which quadrilateral area or triangular area the moving object is included, estimates a passage number representing a number of times the moving object passed at the stored position of the moving object from the stored passage number of the one or two regions of the area including the moving object, and calculates an influence on

the moving object based on the received operational input from the player, the stored position of the moving object, and the estimated passage number; and

an update unit which updates the stored position and the stored velocity of the moving object in accordance with the calculated influence, and increments the stored passage number of the region which is intersected by a line connecting the previous position and the updated position of the moving object[[]], and

wherein, said calculation unit

(a) estimates the passage number for each triangular area having one line segment region for which passage number L has been stored, as L; and

(b) divides each quadrilateral area bounded by two line segment regions for one of which passage number M has been stored and for the other of which passage number N ($M < N$) has been stored so that $N - M + 1$ number of small quadrilateral areas are arrayed in a row and so that one end of the row is defined by the line segment region with the stored passage number M and other end of the row is defined by the line segment region with the stored passage number N, and estimates respective passage numbers of the arrayed small quadrilateral areas, as M, M+1, M+2..., N-2, N-1, N, respectively in order from said one small quadrilateral area at said one end of the row to another small quadrilateral area at the other end of the row.